

CLAIMS

What is claimed is:

5 1. A method for identifying polymorphic markers in a population, the method comprising:

 genotypically characterizing a first sample that includes one or more individuals of a population;

 selecting one or more of the individuals of the first sample based upon the genotypic characterization;

 fabricating a microarray with genomic DNA from each selected individual; and

 genotyping a second sample that includes one or more members of the population using each fabricated microarray as a reference,

 thereby identifying the polymorphic markers in the population.

10 2. The method of claim 1, wherein the population is a bacterial population.

15 3. The method of claim 2, wherein the bacterial population is selected from the group consisting of *Listeria monocytogenes*, *Escherichia coli*, *Lactobacillus casei*,
20 *Lactobacillus lactus*, *Salmonella typhimurium*, *Salmonella entereditis*, and *Salmonella typhi*.

 4. A method for identifying polymorphic markers in a bacterial population, the method comprising:

25 phenotypically characterizing a first sample that includes one or more individuals of a population;

selecting one or more of the individuals of the first sample based upon the phenotypic characterization;

fabricating a microarray with genomic DNA from each selected individual; and

genotyping a second sample that includes one or more members of the population using each fabricated microarray as a reference, thereby identifying the polymorphic markers in the bacterial population.

5. The method of claim 4, wherein the bacterial population is selected from the group consisting of *Listeria monocytogenes*, *Escherichia coli*, *Lactobacillus casei*, *Lactobacillus lactus*, *Salmonella typhimurium*, *Salmonella entereditis*, and *Salmonella typhi*.

6. A method for identifying unique bits among a plurality of bit strings, the method comprising:

providing a plurality of bit strings, each string having the same number and position of bits, each bit having a value of 0 or 1;

generating a graphical representation, including selectable elements, representing the relatedness of the bit strings;

making a selection of a first selectable element;

making a selection of a second selectable element; and

identifying bits that are present in each bit string represented by the first selectable element and absent in each bit string represented by the second selectable element, or that are absent in each bit string represented by the first selectable element and present in each bit string represented by the second selectable element.

7. The method of claim 6, wherein the relatedness of the bit strings is determined by the commonality of bit values at corresponding positions in the bit strings.

8. The method of claim 6, wherein the graphical representation is a dendrogram and the selectable elements are leaves and nodes, each leaf representing a single bit string, and each node representing two or more bit strings.

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9. The method of claim 7, wherein the graphical representation is a dendrogram and the selectable elements are leaves and nodes, each leaf representing a single bit string, and each node representing two or more bit strings.

10. A computer readable medium having software for identifying unique bits among a plurality of bit strings, comprising

logic configured to provide a plurality of bit strings, each string having the same number and position of bits, each bit having a value of 0 or 1;

logic configured to generate a graphical representation, including selectable elements, representing the relatedness of the bit strings;

logic configured to make a selection of a first selectable element;

logic configured to make a selection of a second selectable element; and

logic configured to identify bits that are present in each bit string represented by the first selectable element and absent in each bit string represented by the second selectable element, or that are absent in each bit string represented by the first selectable element and present in each bit string represented by the second selectable element.

11. The computer readable medium of claim 10, wherein the relatedness of the bit strings is determined by the commonality of bit values at corresponding positions in the bit strings.

12. The computer readable medium of claim 10, wherein the graphical representation is a dendrogram and the selectable elements are leaves and nodes, each leaf representing a single bit string, and each node representing two or more bit strings.

5 13. The computer readable medium of claim 11, wherein the graphical representation is a dendrogram and the selectable elements are leaves and nodes, each leaf representing a single bit string, and each node representing two or more bit strings.

10 14. The method of claim 6 wherein each bit string represents the genome of an organism and each bit represents a region of a microarray fabricated from the oligonucleotide segment of the genome.

15 15. The method of claim 1 wherein the genotyping of the second sample includes generating a bit string for each member of the second sample, each bit representing a region of a microarray fabricated from the oligonucleotide segment of the genome for the member and each bit having a value of 0 or 1 depending on the degree of hybridization of the oligonucleotide segment deposited on each region of the microarray;

generating a graphical representation, including selectable elements, representing the relatedness of the bit strings;

20 making a selection of a first selectable element;

making a selection of a second selectable element; and

25 identifying bits that are present in each bit string represented by the first selectable element and absent in each bit string represented by the second selectable element, or that are absent in each bit string represented by the first selectable element and present in each bit string represented by the second selectable element.

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